

CLAIMS

What is claimed is:

1. A stacked-type, multi-flow heat exchanger comprising:
a plurality of heat transfer tubes, wherein each of said heat transfer tubes comprises:
 - 5 a first tube plate;
 - a second tube plate connected to said first tube plate, wherein said first tube plate and said second tube plate form a refrigerant path within said heat transfer tube; and
 - an inner fin having a wave shape, wherein said inner fin is positioned within said refrigerant path and extends in a longitudinal direction along said refrigerant path;
 - 10 a plurality of outer fins, wherein said plurality of outer fins and said plurality of heat transfer tubes are stacked alternately; and
 - a plurality of projection portions formed on at least one of said first tube plates and on at least one of said second tube plates, wherein said plurality of projection portions project into said refrigerant path and extend in an oblique direction relative to said inner fin, wherein said inner fin is connected to said plurality of projection portions.
2. The stacked-type, multi-flow heat exchanger of claim 1 wherein said plurality of projection portions are formed by deforming said at least one first tube plate and said at least one second tube.
3. The stacked-type multi-flow heat exchanger of claim 1, wherein said plurality of projection portions are positioned across the width of said refrigerant path.
4. A stacked-type, multi-flow heat exchanger comprising:
a plurality of heat transfer tubes, wherein each of said heat transfer tubes comprises:
 - a tube plate, wherein said tube plate comprises a flange portion positioned along a center axis of said tube plate, such that when said tube plate is folded along said center axis, said flange portion forms a refrigerant path within said heat transfer tube; and
 - 25 an inner fin having a wave shape, wherein said inner fin is positioned within said refrigerant path and extends in a longitudinal direction along said refrigerant path;
 - a plurality of outer fins, wherein said plurality of outer fins and said plurality of heat transfer tubes are stacked alternately; and
 - 30 a plurality of projection portions formed on at least one of said tube plates wherein said plurality of projection portions project into said refrigerant path and extend in an oblique

direction relative to said inner fin, wherein said inner fin is connected to said plurality of projection portions.

5. The stacked-type, multi-flow heat exchanger of claim 4, wherein said plurality of projection portions are formed by deforming said at least one tube plate.

5 6. The stacked-type multi-flow heat exchanger of claim 4, wherein said plurality of projection portions are positioned across the width of said refrigerant path.

2005/05/20